

WHAT IS CLAIMED IS:

1. A recording medium comprising:
a substrate;
5 a recording layer disposed on the substrate; and
a lubricating layer disposed on the recording layer, wherein the
lubricating layer comprises fluorinated carbon and a thermally stabilizing dopant.
2. The recording medium of claim 1, wherein the thermally stabilizing
dopant is present in an amount of at least 3 atomic % of the lubricating layer.
- 10 3. The recording medium of claim 1, wherein the thermally stabilizing
dopant comprises N.
4. The recording medium of claim 3, wherein the thermally stabilizing
dopant is present in an amount of at least 3 atomic % of the lubricating layer.
5. The recording medium of claim 3, wherein the thermally stabilizing
15 dopant is present in an amount from about 10 atomic % to about 13 atomic %.
6. The recording medium of claim 1, wherein the thermally stabilizing
dopant comprises a compound containing N.
7. The recording medium of claim 6, wherein the thermally stabilizing
dopant comprises NH_3 .
- 20 8. The recording medium of claim 1, wherein the thermally stabilizing
dopant comprises Si.
9. The recording medium of claim 1, wherein the thermally stabilizing
dopant comprises a Si-containing compound.
10. The recording medium of claim 9, wherein the compound containing Si is

selected from the group consisting of Si, SiO₂ and SiH₄.

11. The recording medium of claim 1, wherein the lubricating layer is thermally stable above a temperature of 250°C.

12. The recording medium of claim 1, wherein the lubricating layer is thermally stable at a temperature of 300°C.

13. The recording medium of claim 1, further comprising a buffer layer disposed between the recording layer and the lubricating layer.

14. The recording medium of claim 13, wherein the buffer layer comprises a material selected from the group consisting of a-C:H, a-C:N, a-C:H, N, SiC and B₄C.

15. The recording medium of claim 1, wherein the recording layer is an optical recording layer.

16. The recording medium of claim 1, wherein the recording layer is a hard magnetic recording layer.

17. The recording medium of claim 16, wherein the recording medium further comprises a soft magnetic layer under the hard magnetic recording layer.

18. The recording medium of claim 1, wherein said recording layer is a magneto-optical recording layer.

19. The recording medium of claim 1, wherein the recording medium is a thermally assisted magnetic recording medium.

20. The recording medium of claim 1, wherein the recording medium is an optically assisted magnetic recording medium.

21. A method of lubricating a recording medium comprising:
providing a substrate including a recording layer; and

depositing a lubricating layer on the recording layer, wherein the lubricating layer comprises fluorinated carbon and a thermally stabilizing dopant.

22. The method of claim 21, further comprising providing a buffer layer between the recording layer and the lubricating layer.

5 23. The method of claim 21, wherein the lubricating layer is deposited by exposing the substrate and recording layer to lubricant precursors.

24. The method of claim 23, wherein the lubricant precursors comprise precursors selected from the group consisting of CH_4 , C_2H_2 , C_6H_6 , CF_4 , C_2F_6 , C_6F_6 and C_6HF_5 , and precursors selected from the group consisting of N_2 and NH_3 .

10 25. The method of claim 24, wherein the N is present in an amount from 5 to about 60 vol. % of the lubricant precursors.

26. The method of claim 23, wherein the lubricant precursors comprise precursors selected from the group consisting of CH_4 , C_2H_2 , C_6H_6 , CF_4 , C_2F_6 , C_6F_6 and C_6HF_5 , and precursors selected from the group consisting of SiH_4 , Si_2H_6 .

15 27. The method of claim 23, wherein the lubricant precursors further comprise O_2 .

28. The method of claim 21, wherein the thermally stabilizing dopant comprises N.

20 29. The method of claim 27, wherein the thermally stabilizing dopant comprises SiO_2 .

30. The method of claim 21, wherein the step of depositing a lubricating layer is carried out by a process selected from the group consisting of plasma-enhanced chemical vapor deposition, sputtering and ion beam deposition.

31. A lubricated article comprising a substrate and a lubricant disposed on the substrate, wherein the lubricant comprises fluorinated carbon and a dopant selected from the group consisting of compounds containing N and compounds containing SiO₂.

32. The lubricated article of claim 31, wherein the dopant comprises a dopant selected from the group consisting of N and SiO₂.

33. The lubricated article of claim 31, wherein the dopant is present in an amount from about 3 atomic % to about 13 atomic % of the lubricant.

34. A method of magnetic recording comprising:
providing a magnetic recording head;
providing a magnetic recording medium; and
moving the magnetic recording medium in relation to the head to thereby record data, wherein the magnetic recording medium comprises a lubricating layer including fluorinated carbon and a thermally stabilizing dopant.

35. The method of magnetic recording of claim 34, wherein the thermally stabilizing dopant is N.

36. The method of magnetic recording of claim 34, wherein the thermally stabilizing dopant is SiO₂.

37. The method of magnetic recording of claim 34, wherein the lubricating layer is thermally stable at a temperature above 250°C.

38. The method of magnetic recording of claim 34, wherein the lubricating layer is thermally stable at a temperature of 300°C.